

**BAHLS:**

So the research questions, again, will come from a variety of areas, sometimes fed to them from other disciplines where the questions arise originally-- chemists trying to understand molecular interactions or economists trying to understand some aspect of the global financial system, et cetera. So some of those questions come from outside.

And then some questions are sort of generated from within, building upon work that's previously done in more formal systems or more formal, fewer abstract realms of mathematics.

And when it comes to answering those questions, there's often a good deal of reflection. There's a good deal of going back over what's already known, trying to understand how others have approached similar problems, and picking apart their solutions to understand how those solutions could be adapted and modified to address new and similar problems.

But there's also a lot of experimentation that, I think, gets overlooked. Mathematics is, in some ways, an experimental science in that you can play with the numbers. You can play with the data. You play with your models and play with the tools that you've created and see how they interact with one another. You can use computers to generate a lot of data and see what's happening. So there is a lot of hypothesis testing and hypothesis constructing that goes on.

It is experimental in some ways or at least it can be. And I think that gets overlooked by some of the folks in lab science who are used to working with-- getting their hands wet, literally, with the stuff in the lab. Mathematicians do the same thing. Maybe they don't get their hands quite as literally wet. But you can still pour through the data and try to understand what's going on.

And then it's a matter of reflecting on the data and reflecting on the work of others and trying to bring it together and synthesize it, analyze it in some way that helps make sense of it all and does so according to accepted rules of logical inference. So we all agree as a community of mathematicians that these are the rules of logic that you're allowed to follow. And if you follow those rules and you make your arguments, you build your arguments in that fashion, then you're coming up with a valid approach to solving a particular problem.